

TWEENING-BASED CODEC FOR SCALEABLE ENCODERS AND DECODERS WITH VARYING MOTION COMPUTATION CAPABILITY

ABSTRACT OF THE DISCLOSURE

5 A scaleable video encoder has one or more encoding modes in which at least some, and possibly all, of the motion information used during motion-based predictive encoding of a video stream is excluded from the resulting encoded video bitstream, where a corresponding video decoder is capable of performing its own motion computation to generate its own version of the motion information used to perform motion-based predictive decoding in order to decode the bitstream to generate a decoded video stream. All motion
10 computation, whether at the encoder or the decoder, is preferably performed on decoded data. For example, frames may be encoded as either H, L, or B frames, where H frames are intra-coded at full resolution and L frames are intra-coded at low resolution. The motion information is generated by applying motion computation to decoded L and H frames and used to generate synthesized L frames. L-frame residual errors are generated by performing inter-frame differencing between the synthesized and
15 original L frames and are encoded into the bitstream. In addition, synthesized B frames are generated by tweening between the decoded H and L frames and B-frame residual errors are generated by performing inter-frame differencing between the synthesized B frames and, depending on the implementation, either the original B frames or sub-sampled B frames. These B-frame residual errors are also encoded into the bitstream. The ability of the decoder to perform motion computation enables motion-based predictive
20 encoding to be used to generate an encoded bitstream without having to expend bits for explicitly encoding any motion information.

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